These Notes provide some background on the basic economic analysis underpinning the course on World Agriucltural Policies. They begin with an outline of the theory supporting the proposition that free trade and perfect competition provide a rational benchmark against which to assess the effects of policy intervention.

The Reasons and Rationale for Government & Policy :

Why is there government policy? No single economic system can function perfectly to achieve an allocation of resources, a pattern and mix of output and a distribution of income that makes the optimum contribution to the collective welfare of society. At one extreme, a system of complete central planning, decision making and administration would result in major inequities and inefficiencies because of the impossibility of exercising effective control over something as complex as a national (or even local) economy, and because the absence of personal incentive is said to destroy much of the efficiency of the market place. At the other extreme, a completely unregulated free enterprise system would result in a different, but no more acceptable, set of inequities and inefficiencies (public goods, externalities, imperfect competition etc. - see AEF116 notes if you have forgotten about these). A mixed economy is a fact of life.

Starting from the extreme of "no government" (the unregulated free enterprise economy), there are economic pressures which guarantee the establishment and maintenance of a 'government' to 'intervene' in or 'regulate' the economy. Governments can be seen as a logical and inevitable product of the *laissez faire* market ideal, even if their existence were not required for political, social, diplomatic and institutional reasons. Adam Smith's invisible hand is inevitably attached to the long arm of the law (see, e.g. Harvey, "The Role of Markets in the Rural Economy" Ch. 1 in Change in the Countryside, ed. P.A. Allanson & M.C. Whitby, Earthscan, 1997)

The economics of government can be seen as an extension of welfare economics and the associated notion that collective (or social) welfare is the ultimate aim of all economic activity. An institution (Government) with the responsibility and power to take economic action on behalf of the whole society is needed in the interests of both efficiency (to solve market imperfections) and equity. Nevertheless, the existence of government does not guarantee that all government decisions on behalf of the citizens will accord with every definition of "the public interest". The interaction of politics and economics in the study of public policy provides a warm, if not always illuminating, discipline.
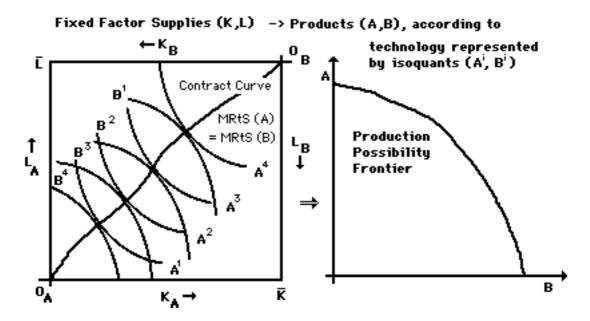
The Reasons for Government Intervention.

The economic theory of welfare optimisation stems from Adam Smith, and although variously extended and developed, still provides the foundation for economic policy analysis (Just *et. al.*, 1985). In essence, the theory holds that a system of perfectly competitive markets (in which there is freedom of entry and exit in all markets, all actors are price-takers and for whom private costs and benefits are identical with social costs and benefits) is capable of generating a socially optimal allocation of resources to the production of goods and services for the population, such that no one person can be made better off without making at least on other person worse off (the Pareto welfare criterion). While the elementary versions of this theory assume perfect information, more sophisticated developments allow that information can never be perfect and that information-gathering, decision making and associated risk-taking themselves are resource-using activities, and subject to optimisation within the welfare calculus.

RESUMÉ OF THE GENERAL EQUILIBRIUM OF MARKETS.

The following brief notes outline the economic theory of welfare optimisation - the theory of how markets achive an optimal allocation of resources. The argument is in three basic steps (I, II, and III below). This material is covered in (eg) Ritson, C. : Agricultural Economics: Principles and Policy, Granada, 1977, Chapter 5.
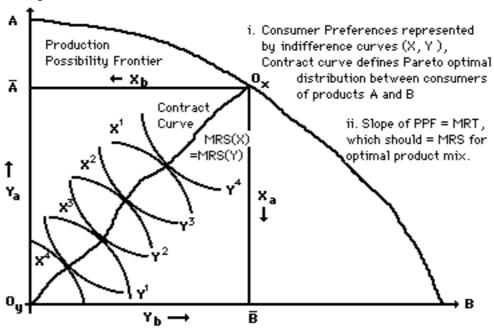
I General Equilibrium theory suggests that the necessary conditions for an economy to achieve a "Pareto Optimal" allocation of resources are as follows (I.i, ii and iii), given a two person (X, Y), two factors of production (K, L) and two good (A, B) world. Pareto Optimality simply means that it is not be possible to make one person better off without making at least one other person worse off. If we can achieve this position, then the economy is operating efficiently. To ensure this position, it is necessary to achieve Production efficiency, Consumption efficiency and Exchange efficiency, as follows.

i Production efficiency: Marginal rates of technical substitution between factors of production are equal in production. To show this, we use the idea of the production isoqants (see AEF116 Notes if you have forgotten about this). The following figure shows - in the left hand side, two different sets of production isoquants (one for each product, A and B) superimposed on each other by fliping one diagram (for B) over so that its origin lies at the north east corner instead of the south west corner - in a construction known as an Edgeworth Box diagram.

Production efficiency requires that it should not be possible to increase output simply by substituting one factor of production (or input) for another in the production processes. Combinations of factor use which optimise output levels are identified by the "contract curve" in the LHS diagram above, which is defined as the points of tangency of the isoquants. If production process mixes do not lie on this contract curve, then it is possible to increase the production of one good without reducing the production of the other. Thus, only points on the contract curve are efficient. The slopes of the isoquants show the marginal rates of technical substitution in production of these two factors, and are equal for each product for production efficiency.

It is this contract curve which defines the **production possibility boundary** on the RHS diagram, which is plotted in "output" space - products A and B measured on the axes instead of inputs (factors) in the LHS diagram. Thus the production possibility curve (the general equilibrium counterpart of the supply curve) shows the levels of output possible if the economy is working efficiently.

B. 'consumption' efficiency: that the marginal rates of substitution between products should be equal for all consumers. This is shown in a similar fashion to production efficiency - with an Edgeworth Box diagram of consumption indifference curves for the two individuals (X and Y), where the slopes of the indifference curves show the marginal rates of substitution in consumption for each individual. Here, though, we construct this diagram <u>within</u> the Production Possibility Frontier we derived in the first step above, so that we know what total bundle of goods (A and B) we are dealing with.
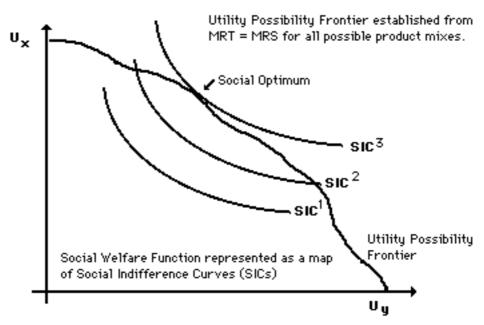

Consumers are able to trade goods between themselves and each be better off <u>unless</u> they are on the consumer contract curve. Anywhere on the contract curve means that it is not possible for one consumer to be better off without making the other worse off. Anywhere on this curve is characterised by equal marginal rates of substitution in consumption (indifference curves are tangential).

C. Exchange efficiency: that the marginal rates of transformation between products should equal the (common) marginal rates of substitution in consumption; $MRT_{an} = MRS_{an}$. (that is, the slope of the PPF should equal the slope of the indifference curves, thus defining the distribution of goods between consumers which is economically efficient *for any given point on the production possibility frontier.)* If this condition does not hold, then it would be possible to make one person better off without making the other worse off by changing the production mix to a different mix of products A and B.

This condition means that, for any <u>given</u> distribution of goods between consumers, there is an optimum mix of production (point on the PPF), at which the Marginal rate of substitution in production (the technical substitution rate), is equal to the marginal rate of substitution in consumption.

In essence, we could plot the welfare (at least by rank - that is whether the individual feels better or worse off but not necessarily by how much) of each consumer against each other to get a 'social' welfare frontier - take the contract curve from the LHS of the above diagram and re-draw it to show the fact that as one consumer is made better off, the other is made worse off, which can be thought of as the general equilibrium equivalent of the demand curve.

Now, there will be different 'social' welfare frontiers for each point on the PPF, and these frontiers may cross. BUT, there will be a frontier (the "Utility Possibility Frontier") which can be defined as the envelope of all the possible social welfare frontiers.

Utility Possibility Frontier established from MRT = MRS for all possible product mixes.

Social Optimum

SIC³

SIC²

SIC¹

Utility Possibility Frontier

Social Welfare Function represented as a map of Social Indifference Curves (SICs)

As long as an economy satisfies these conditions somehow, then it will be on its Production Possibility Frontier, and, furthermore, that the economy will also be on its Utility Possibility Frontier in the diagram above, in that it is impossible to make one person better off (give them more goods and services) without making someone else worse off. In that sense, the economy will be "Pareto Efficient"

II. The distribution of income, wealth, and goods and services will depend on the distribution of claims on the incomes provided by the factors of production. The Welfare Optimum which includes the society's judgement about the appropriate distribution can only be determined with reference to a Social Welfare Function which defines society's preferences and provides a Social Indifference Map. According to this theory, it is **only by reference to this Social Welfare Function** that society can determine the socially optimal distribution of personal utilities.

III. The **Duality Theorem** states that a perfectly competitive economy (with prices everywhere equal to marginal costs, and with private costs and benefits equal to social costs and benefits) will achieve these necessary conditions for Pareto Optimisation, **given** the initial distribution of income (that is the initial distribution of factors of production which earn the income) between the individuals. It is this distribution which is determined by the Social Welfare Function.

Conclusions

Although illustrated for a simple two good, two person, two factor economy - this logic does generalise to many people, many goods and many factors. However, it also demonstrates that economic efficiency of allocaton of resources does not necessarily guarantee a socially acceptable distribution of economic welfare - for that we have to appeal to an independent assessment of the social welfare function - the province of politics.

IMPLICATIONS FOR THE ROLE OF GOVERNMENT.

In this simple model of the world, there are four major functions for government[1].

i.   **The Policeman:** to establish and maintain the legal and judicial framework within which the market will operate, both at the national and the international level, including the important role of establishing and policing property rights. The free market involves a massive number of transactions, each of which can be viewed as a contract between buyer and seller. The efficient working of this system requires that both sides of the market have confidence in the security and probity of these transactions. The costs of ensuring this are typically assumed away in elementary analyses, but are not insignificant, especially in atomistic markets (with a great many individual buyers and/or sellers) characterised by long-term decisions and associated difficulties of uncertainty and risk, such as the agricultural or housing sectors. Solid and well-policed laws of contract are necessary (but not always sufficient) conditions for the efficient operation of the free market. In short, at the door of every auction room there stands a policeman, and the long arm of the law is necessarily attached to Adam Smith's invisible hand.

ii.   **The Doctor/Engineer** to correct "market failures" including at least the organisation of the provision of public goods (defence, government itself, etc.) and the correction of the free enterprise system for externalities, imperfect competition and monopoly, all of which prevent the free market from attaining the social optimum. The key problems with public goods (see later) are: a) that these goods are **non-rival** in consumption, meaning that one person's use or consumption of the good (or service) does not deny another person use of that same (unit of) good; b) that prevention of people (such as non payers) from consuming or using of the good is either impossible or impossibly expensive - the so-called **non-exclusion** characteristic. In other words, once a public good is supplied to one, it is supplied freely to all, a market condition in which private entrepreneurs cannot survive. Hence the pure free market would not be expected to provide any of these goods.[2] Externalities (pollution is the traditional example, pretty landscapes, pleasant housing estates or the converse, dilapidated estates are other examples) exhibit a similar problem in that typical rational market transactions cannot account properly for their production or consumption. They arise as more or less unintended by-products of either consumption or production, and once produced are difficult or impossible to price, often since they have public good characteristics, as in the above examples. However, since they are directly associated with normal market transactions, textbook solutions of adjusting the price of the marketable good through taxes or subsidies can theoretically correct the market signals for these goods.

iii.   **The Pharmacist/Mechanic**: to encourage and foster economic efficiency, both in static terms - the need for which can be seen as resulting from the public good characteristics of information and transactions systems; and in dynamic terms to assist in adjustment to changing circumstances, which might be associated with externalities of progress and growth and with the public good aspects of technological change. This function can also be seen as operating at both the macro and micro level in the economy.

iv.   **The Judge**: to redistribute income and wealth in the interests of equity, since welfare optimisation theory takes the initial resource endowment distribution between people as given, while (eg. Rawls, 1971) there is every reason to suppose that societies regard equitable (not

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[1]   See, e.g. Grant, R.M. (1975) "Economic Problems, economic theory and the role of Government", Ch 1 in *Current Issues in Economic Policy*, ed. Grant, R.M. and Shaw, G.K., Philip Allan, Deddington.

[2]   A moments reflection will provide real life examples which contradict this proposition, public service television in the US for instance, which relies on voluntary subscriptions from those with a social conscience, or the Trinity House lighthouse system. In fact, more sophisticated analysis, attributable to Lindahl and Samuelson (see, e.g. van den Doel, 1979) shows the possibility of negotiations between people to group together to ensure provision of such goods, while the simple theory does not deny the possibility that one or two rich people might choose to 'buy' such goods for themselves and thus also provide them for others. Nevertheless, traditional economic theory driven by self-interested rationality finds it difficult to explain private (non government) provision of public goods to the extent that can be observed.

necessarily equal) distributions [of endowments, wealth, income, good and service provision and entitlement, and spatial patterns of economic activity] as desirable;

v.	In addition to these four well-recognised functions of government in a market economy, a fifth function should also be added: The Priest: - as the guardian of public morals and ethics, requiring additional roles to those envisaged by the clinical calculus of neoclassical economics for the policeman and the judge.

According to this view of the world, there are legitimate reasons for the intervention of government in the agricultural sector of the economy. As far as agriculture is concerned, the following arguments are advanced, paraphrasing and re-interpreting the objectives of agricultural policy as laid out in (for example) the 1947 Agriculture Act and the European Union's Treaty of Rome.

i.	Early in the development process, the agricultural policy problem is seen as a **"food problem"** - ensuring adequate supplies of food at reasonable prices for all consumers. Arguments under this heading call for interventions by the Judge, the Doctor and the Pharmacist, it seldom being the case in such under-developed economies that the market system can be relied upon to function competitively and effectively.

ii.	Economic growth leads to a relative decline in the share of economic activity and income accruing to those in the agricultural sector - often characterised as the **"farm problem"**[3]. Although this decline is a necessary economic signal for resources (including but not restricted to labour) to leave agriculture, the result is frequently seen as leaving those remaining in agriculture as deprived and worthy of support by the Judge, or as deserving of assistance in the adjustment process by the Pharmacist. Associated with this general tendency is the issue of 'asset fixity', through which returns earned by capital in the sector fall below those necessary to justify the replacement costs but continue to exceed those necessary to justify continued use of the existing stock. Given the longevity of much farm capital, the adjustment process is slowed as a result. However, rational expectations should allow the sector to incorporate such adjustment costs appropriately in their decisions, providing that declining income opportunities are anticipated.

iii.	The Pharmacist is also seen as having an ongoing role of fostering economic efficiency within the sector through the support of Research and Development and of extension or advisory services which might otherwise not be provided to optimal levels by a competitive market place.

iv	The farm sector is typically **atomistic** and seen as facing potentially imperfect competition or monopolistic tendencies in the upstream (input supply) and downstream (food processing etc.) sectors, necessitating policies to offset the inefficiencies of such imperfect competition from the Doctor.

Government intervention in agriculture is frequently argued to be necessary to **stabilise** markets. However, there is reason to be suspicious of such arguments from a strictly economic point of view. 'Instability' (or, more accurately volatility) is seen as being a natural feature of agricultural markets because of the dependence of the sector on natural processes and weather patterns. Volatile markets offer opportunities for private traders to "buy cheap (store) and sell dear" and a competitive market would be expected to provide for an efficient level of price and quantity stability through storage and arbitrage between markets. Given the existence of perfectly competitive capital and contingent (insurance) markets, private market decisions should provide the optimal level of storage and price stability from an optimal resource allocation point of view (see later in the course for more detailed discussion of stabiity issues)

Differences between the private market's discount rate (as a reflection of the opportunity cost of capital) and the social discount rate (as the appropriate time preference rate at which to discount the future) can lead to sustainable arguments in favour of public intervention to ensure socially optimal stock-holding, though the appropriate policy prescription. in these circumstances is typically that private storage should be subsidised rather than the government holding stocks

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[3]	Gardner, 1992, provides a thorough rehearsal of both theory and (failing) evidence for these propositions in the US context. The UK and European experience is further discussed below.

directly (which 'crowds out' private storage). It is also possible that differential perceptions of risk between the market and public sector (where the government is more risk-neutral than the private sector) can lead to arguments in favour of government supported storage, with similar prescriptions.

There are also arguments that the appropriately **competitive capital and contingent** (insurance) markets do not exist and that, as a consequence, private markets will not store an optimal amount[4]. Here, the arguments are typically that **transactions costs** are too high and/or that information is asymmetric between opposite sides of the market. Two particular problems arise. The first is **moral hazard**: borrowers can behave in a more risky fashion than anticipated by the lender, and be beyond the control of the lender in adopting this behaviour (a combination of asymmetric information and high transactions costs). Similarly, in contingent markets, insurance might encourage less care than otherwise being exercised to avoid the potential damage or poor outcome. This possibility leads lenders to 'over-estimate' the extent of risk involved in the loan or insurance policy, reflected in higher borrowing rates or premium rates than are 'objectively' justified.

The second is **adverse selection**: those with a greater risk of bankruptcy or of potential loss are (perhaps) more likely to seek loans or insurance policies, hence requiring greater interest rates or premia than would be justified if the total affected population were in the market. However, in both cases, it can be argued that these conditions are simply a reflection of the costs of information, transactions and uncertainty and that to argue that otherwise competitive markets are less efficient than they would be if such costs did not exist is tantamount to arguing that all economic activity is inefficient compared with a situation in which (for instance) energy was much cheaper through cold fusion technology than is currently the case.

However, it is often argued that volatility and associated risk of agricultural markets lead risk-averse producers to be more conservative than otherwise in their production and resource allocation decisions, thus reducing the efficiency of the sector compared with a risk-free situation. It is further argued that contingency (eg insurance) and forward markets are often insufficient to allow an atomistic industry such as agriculture to properly spread risks, and that there is a case, therefore, for government intervention through the Pharmacist function to provide for underwritten insurance and income stabilisation schemes.

Especially in the UK, it has also been argued that there is a case for intervention in the agricultural sector to encourage domestic production in the interests of improving the national **Balance of Payments and provide for domestic food security**. The economic justification for these arguments has long been recognised as suspect (eg. Ritson, 1980; Sturgess, 1992), not least because it is unclear why the farm sector needs special consideration under these headings or what sort of market failure or market inefficiency is being advanced.

More recently, as the agricultural issues have moved from a "farm problem" to a **"resource problem"** focus, some stronger arguments have been advanced for government intervention (Doctor) to provide for the externality and public good aspects of rural land management, often with Priestly overtones. Here the arguments are that private decisions about production practices and land use ignore the social costs and benefits associated with the rural and natural environment, requiring intervention to ensure consistency between the two.

As a consequence of the present trend towards a more de-regulated agricultural sector, it is to be expected that arguments in favour of rural resource preservation and sustainability, as well as those connected with stability and the competitive behaviour of the agri-food system, will become more prominent, leading to the characterisation of the policy issue as a "resource problem". Furthermore, such arguments will incorporate a strong international and global focus as a result of the 1994 GATT Uruguay Round agreement committing signatories to a degree of international control over domestic policies.

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[4]   Newbery, D. and Stiglitz, J., 1981: *The Theory of Commodity Price Stabilisation: a study in the economics of risk*, Oxford, Clarendon Press, 1981 is the definitive textbook here.

References:
Gardner, B.L., 1992: "Changing Economic Perspectives on the Farm Problem", Journal of Economic Literature, 30 (March), 62 - 101
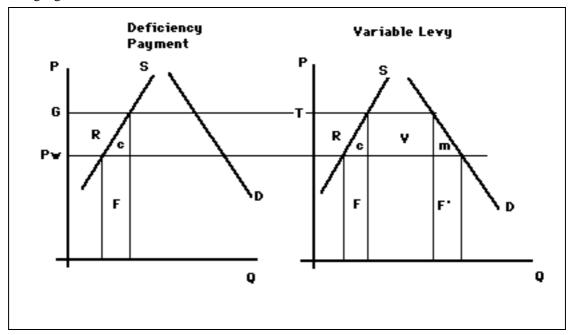
Just, R.E., Hueth, D.L. and Schmitz, A., 1985: *Applied Welfare Economics and Public Policy*, Prentice Hall

van den Doel, H.& van Velthoven, B.; *Democracy and Welfare Economics,* Cambridge University Press, 1993.

Ritson, C. (1980): Self-Sufficiency and Food Security, CAS Paper 8, Centre for Agricultural Strategy, Reading, March

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II.   FORMAL APPROACH TO POLICY ANALYSIS & KEY ASSUMPTIONS:

This section follows Josling (Formal Approach & Review articles) and is covered by Ritson.

A.   The simple *comparative static partial* analytics should be well known, and are shown in the following figure

		Deficiency Payment	Variable Levy
1	Budgetary Cost:	R + c	-V
2	For. Ex. Savings:	F	F + F'
3	Prod. Surplus:	R	R
4	Cons. Surplus:	none	R + c + V + m
5	Transfers;		
	-to producers:	R	R
	-from cons.:	none	R + c + V + m
	-taxpayers:	-[R + c]	+V
6	Net Econ. Surplus:	-c	-{c + m}

The concepts contained in this simplistic representation of market intervention policy are critical: make sure you understand it: What is the difference between a deficiency payment and a subsidy? What is the difference between a tariff and a variable levy? If you cannot answer these questions - find out or think it out before you read on!

Josling goes on to extend this analysis by identifying the average and marginal costs of achieving the objectives of income transfer, foreign exchange saving, and economic cost:

		Deficiency Payment		**Variable Levy**
1	**Economic Cost/Income transfer:**			
	Average:	c/R	<<	[c+m]/R
	Marginal:	c/ R	<<	[c+m]/ R
2	**Economic Cost of Foreign Ex. Saving:**			
	Average:	c/F	=(*<)	[c+m]/[F+F']
	Marginal:	c/ F	=(*<)	{c+m}/ {F+F'}
3	**For. Ex. Saving / Income transfer:**			
	Average:	F/R	< (*>)	[F+F']/R
	Marginal:	F/ R	< (*>)	{F+F'}/ R

Note: * signifies the effect of allowing for second round effects of tariff (variable levy) via the "user cost" encouraging additional imports of the processed product unless these too are protected (see Josling - Formal Approach article).

Note, too, the economic conclusions about the savings of foreign exchange.

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Review your understanding of this by repeating it for an exporting country.

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References:
Josling, T.E. (1974); "Agricultural Policies in Developed Countries: A Review", *J. Agric. Econ.*, **25** (3), 229 - 264
Josling, T.E.(1969): " A Formal Approach to Agricultural Policy', *J. Agric. Econ.*, **20** (2), 175 - 195

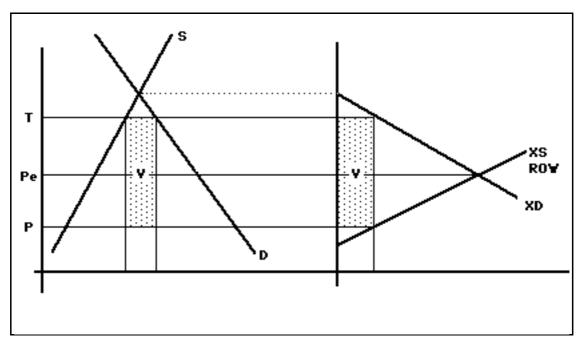## B.   Foreign Exchange Saving arguments

(for analysis of World Market interactions- see AEF372 but WHY are they important?):

The above takes no account of the effect of altering one country's trade balance in one commodity on the rest of the economy or the rest of the world. Extending the analysis by dropping the *small country assumption (which means?)* makes the approach more general as opposed to partial, and leads to the notion of an

Optimal Tariff.

As T is increased above Pe, so the levy revenue increases because of the **effect on world prices (which is what?)**, as well as falling because imports are reduced.

The figure below outlines the extension of the partial analysis to include the world market - represented as an *Excess Supply function* for the rest of the world (XS, RoW). The XS curve represents the difference between Supply in the rest of the world and Demand in the rest of the world at each and every price. Similarly, The XD curve is drawn in the RH diagram as the difference between the domestic demand (D) and supply (S) curves in the LH diagram at each and every price. *Make sure you understand this .*   Consequently, the world market price is determined by the intersection of the XS and XD curves in the RH diagram. *(This analysis is dealt with in more detail in the notes for the course.)*

The benefit of the increased tariff because of the world price (or *terms of trade*) effect can offset the increased cost to the consumer and to the economy, at least for small increases of T over Pe. Clearly at the"self-sufficiency" price (no imports) there will be no levy income and the consumer will bear the full cost of the transfer to the producers, and the economic cost will be the full triangle between the "self-sufficiency" price and the resulting low world price, regardless of the elasticity of the ROW Excess Supply function. On the other hand, with no levy (import tariff), there is no transfer or economic cost. As the wedge between the world price and the domestic rice is increased through increasing the tariff, so the (partial) net gain to the country increases, reaches a maximum and then falls to eventually reach the (negative net gain) full welfare triangle between the self-sufficiency (autarchy) price and the associated (low) world price - hence the notion of an *optimal* tariff which maximises the partial net gain for the country.

B.ii.   Reciprocity:
a.   Retaliation: Imposition of tariffs and variable levies may result in trading partners resorting to trade protection of their own, thus affecting this country's exports and imposing costs on the rest of the economy not accounted for in the simple analysis;
b.   **General equilibrium** effects abroad: Reduction in other countries foreign exchange earnings as a result of the reduction in this country's imports from them could lead to a reduction in their GNP, hence a reduction in their imports from this country, even if they don't directly retaliate. Alternatively, deterioration of foreign BoP accounts leads to falling exchange rates, and more competitive foreign supplies, both in their own markets and on the world market - damaging this country's trade.

B.iii.   Domestic supply effects:
a.   Import content of additional inputs used in the expansion of domestic production alters the simple (partial) conclusions about foreign exchange savings - *make sure you understand how*;
b.   Opportunity cost of factors used in the domestic expansion, in terms of their possible contribution to exports or import substitution elsewhere in the economy, are ignored in this analysis.

B. iv.   Domestic Demand effects:

Change in consumer expenditure (usually up, with increased consumer prices for food) means that incomes available for expenditure on other goods will fall, and GNP will be lower than otherwise - with what effect on BoP??

B. v.　　Relevance of foreign exchange objective:

Given a floating exchange rate system, what is the advantage of an "artificial" improvement in the BoP? Exchange rate improves, making imports cheaper and exports more expensive -> circular argument for greater protection? Is the BoP argument simply "do it yourself" economics in favour of self-sufficiency? (see Ritson, CAS Paper, and Sturgess, 1992 for more on self-sufficiency and security arguments).
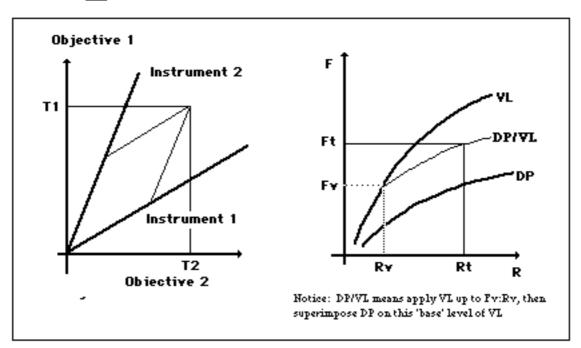
References:
Ritson, C. (1980): Self-Sufficiency and Food Security, CAS Paper 8, Centre for Agricultural Strategy, Reading, March

Sturgess, I. 1992, " Self-sufficiency and Food Security in the UK and EC", *JAE*,**43** (3), 311 -326

C.　　INSTRUMENTS AND OBJECTIVES:

Josling (Review article) repeats the important Tinbergen result for policy optimisation, namely that, to achieve several objectives simultaneously, we need at least as many instruments as there are objectives. In simple terms, if progress towards the objectives is measured on the axes of the diagrams below, the each instrument (DPs or VL) will have different effects on each objective, and to achieve specific targets for both objectives, we will need to combine two instruments. (a *necessary* but not *sufficient* condition for satisfaction of multiple objective targets - Tinbergen)

The LHS of this diagram illustrates the principle for two unspecified instruments and objectives. The RHS illustrates the principle through stylised effects of Variable Levies (VL) and Deficiency Payments (DP) on foreign exchange savings (F) and transfer to farmers - or better, to the agricultural sector (R). At each and every level of transfer (R), DP generates smaller foreign exchange savings than the transfer-equivalent VL. But if our 'target' for F and R is specified as Ft:Rt, then we need a combination of both instruments to achieve this target - VL up to point Fv:Rv, and then a DP on top of this, to move us along the VL/DP curve.

Can you illustrate this mixed policy on the commodity market diagram? Make sure you can.

[Note: Josling's treatment of this point, RHS of above diagram, is slightly more complicated because he relates the target foreign exchange saving, Ft, to the economic cost of the policy instruments. Thus F/c can be seen as a shadow exchange rate, since the economic cost (c or [c+m])
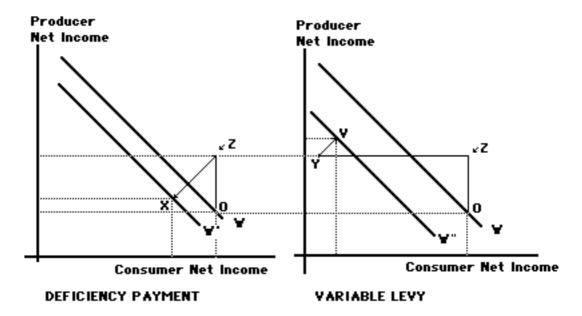
is the GNP cost (at full employment) of the use of the instrument. The target foreign exchange saving can then be seen as the slope of the policy instrument expansion path in F-c space, (see the Formal Approach article for this, or Ritson's text book).

<u>References</u>
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Josling, T.E. (1974); "Agricultural Policies in Developed Countries: A Review", **JAE**., **25** (3), 229 - 264
Ritson, C. Agricultural Economics: Principles and Policy, Granada, Chapter 5.

D. EQUALITY OF TRANSFERS UNDER DIFFERENT POLICIES.

Josling (Review) questions the usual assumption that the transfer to producers (R) is the same for both the variable levy and the DP so long as the domestic/world price difference is the same in both cases. The question arises from considering the net-of-tax positions of the producers.

Starting at the free trade equilibrium (O) on "welfare indifference curve" W (see below), the DP transfers R to producers, represented by OZ, which then has to be financed by taxpayers (cost=R+c), represented by the line ZX, whose slope reflects the share of producers and consumers in financing the central government budget. The final point may not improve the net-of-tax position of producers very much, while consumers are unambiguously worse off [W' lies inside W because of the economic cost of the intervention (c)].

With the VL instrument, transfer R is again represented by OZ. The consumer loss is represented by ZY, as the measure of (R+c+V+m), while the transfer to taxpayers of V now benefits both producers and consumers as taxpayers, and moves the final distribution by YV to V. The conclusion is that the net income of producers is improved (to the extent that they are taxpayers, at least) by more under the VL system than under the DP instrument, though net welfare, at W" is less than under the DP programme.

This analysis raises the more general question of the "valuation" of receipts and expenditures by the people concerned, measured by the notions of consumer and producer surplus (see below).

Notice, however, that producers are also consumers (a point not elaborated by Josling). In the case of most developed countries (Ireland, Spain, Portugal Greece?) food consumption expenditure represents a small fraction (+/- 15%) of total spending so that this point may not be a substantial one - but when we consider developing or poorer countries where food consumption spending is a much higher fraction of total income, this may be important, and would tend to reverse these conclusions - **try the analysis for yourself.**

David Harvey, AEFM, Jan, 2000   12

Note, too, that this discussion is different from the question as to whether producers see their benefits (R) identically regardless of whether these benefits derive from the market place, as they do under the variable levy, and can be regarded as fair and just reward for contribution to social goals, or whether they come in the form of a cheque from government, as they do under the Deficiency Payment instrument, in which case the spending is a "line item" in the Government's budget and is subject to annual review and possibly revision, while looking more like a "welfare" payment to farmers. But these points, too, emphasise the fragility of the assumption that R is identical in both cases.

E.   CONSUMER SURPLUS MEASUREMENTS.

How do we measure consumer benefits and why? - What is consumer surplus?

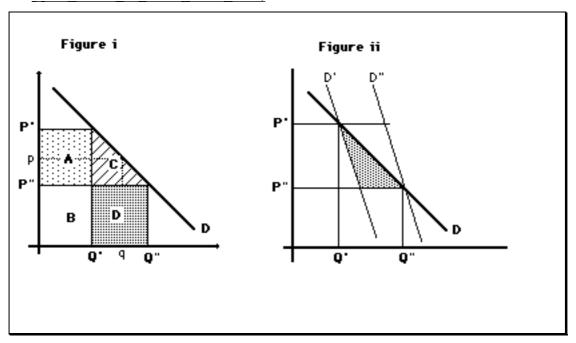   *a.   Constant real income demand curves;*

Figure i shows the conventional consumer surplus for an individual consumer (j) measure of a move from P' to P" as a gain of A+C, made up of a reduction in price on the original quantity purchased (Q'), which is area D; and the net benefit of the additional consumption (Q"-Q'), valued as the total amount this consumer would have been "willing to pay" for this additional quantity (C+D) less the amount j actually does pay (D), giving the net benefit of additional consumption as C.

But the movement down the conventional demand curve (constant money income), actually involves an increase in real income, since the price of this good has fallen and all other prices are assumed to remain constant. This is clearly impossible in a <u>general</u> equilibrium context - simply changing the price of one good cannot increase incomes in the whole economy.   In principle, consumer j would be prepared to give up money income in order to take advantage of the fall in price [The so-called "Equivalent Variation" in income]. As j does give up money income, so will the demand curve shift to the left, for normal goods with positive income elasticities.   The constant real income demand curve will look like D' in figure ii. The conventional consumer's surplus measure will overestimate the actual value of the price fall by the amount of the shaded area, taking account of the fact that total income cannot be increased as a result of a price change in a single market.

On the other hand, if we ask how much income consumer i would want to be prepared to put up with P' rather than take advantage of P", then the appropriate constant real income demand curve

becomes D", and the conventional measure is an underestimate of the "true" value of the price change to this consumer. This is the "Compensating Variation" in income.

Correction of the usual measures of consumers' surplus is possible using estimates of the income elasticities of the good in question. So long as these are close to zero, or the price changes are small, then the difference is unlikely to be important.
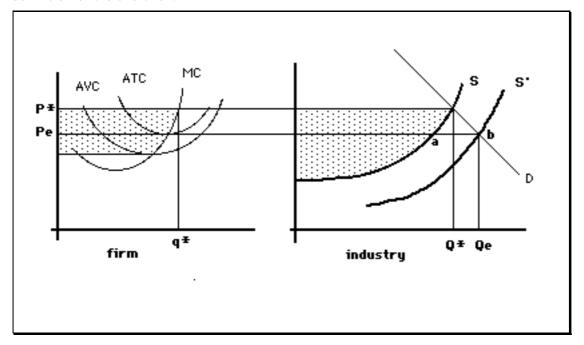
> *b.   Additional/related price changes:*

Similar corrections can be made to allow for several price changes at once, which would shift the consumers' demand curves for each good. Review your understanding of this by trying the analysis for changes in two prices for complimentary and substitute goods.

> *c.   Aggregation Problems:*

i.   For the individual: above assumes that j's marginal valuation of income is constant for all price changes under consideration (usually not too heroic for the changes normally considered)

ii.   But, for an aggregation over all consumers, it is necessary to assume not only that all consumers' marginal valuations are constant, but also that they are all equal, regardless of their individual circumstances. This is clearly a much more serious and heroic assumption. **What do you think, and how might we correct for this?**

F.   PRODUCERS' SURPLUS

Measured as the area between the price lines and above the supply curve. What does it actually measure? In the short run, this amounts to a summation of the areas above the marginal cost curves (above the shut down point) for all firms, that is the "quasi-rents" accruing to the fixed factors. [Equivalent to the shaded areas below, in total], and will clearly depend crucially on the definition of the short run.

In the long run, these quasi-rents will be "capitalised" into the price (opportunity cost) of the fixed factors, and the long run supply curve will slope upwards because:
- some production factors are in fixed or inelastic supply;
- real external dis-economies of industry scale (implies that some non-marketed factor of production is in inelastic supply);
- some inputs to agriculture are less than perfectly elastic in supply, so that input prices increase in real (relative) terms as output is increased, even in the long run. This implies that some factors of production in the input supply industry are in inelastic supply. Alternatively, the

agricultural industry is not a 'small industry' (cf the world market arguments above), so that increased demand for inputs increases price of these inputs.

Measuring Producer surplus over a long run supply curve amounts to a measurement of the increased rents to the owners of the fixed or inelastic factors somewhere up the supply chain, (ie. not necessarily associated with the industry directly at all)

Once again, in aggregating this estimate of producer gains/losses from price or policy changes over all factor owners, we have to assume that the marginal valuations of income (rents) are *constant and equal* among all people.

G. SOCIAL ACCOUNTING: THE CRUCIAL ASSUMPTIONS.

In conducting the usual economic welfare arithmetic, ie adding up consumers' and producers' surplus, and the costs/benefits to taxpayers, we have to assume:

i.   that the marginal utility of income is constant and equal among all people concerned, regardless of their circumstances or of the differential effects of the policy changes considered; (the implications of this assumption -the most critical- are dealt with below, section H);

ii. that the private costs and benefits do, in fact, reflect the social costs and benefits (ie that any relevant externalities and public goods (see below) have been appropriately included and accounted for);

iii. that, given that most policy changes involve some gainers and some losers, not only can the gainers compensate the losers and still leave everyone better off, but that this compensation is actually carried out. If not, then a policy shift can only be declared Pareto superior *(do you know what this means?)* if the compensation test works both ways (that is the gainers from the change can compensate the losers, and also that the losers cannot afford to bribe the gainers not to make the change)- in order to avoid the "Scitovsky Paradox", otherwise it is possible that a policy move in one direction (eg to free trade in European agriculture) could be judged Pareto preferable, and once made (without compensation of the losers - the producers) a move in the opposite direction could also be judged Pareto preferable (in this case, because of the optimal tariff argument, for instance);

iv. that "Second Best" does not apply. The theory of Second Best says that, if the conditions for a Pareto Welfare optimum (equality of marginal rates of substitution and transformation everywhere in the economy) do not apply in one sector of the economy, then there is no necessary presumption that their enforcement elsewhere will necessarily improve the welfare of the society compared with a situation in which these conditions are violated elsewhere.   In essence, the theory says that violation in one part of the economy means that an 'offsetting' violation somewhere else is likely to be Pareto preferable to their satisfaction everywhere else.

However, this argument, which is absolutely sound from a theoretical point of view, ignores the fact that in practice it is impossible to "get everything right" simultaneously and immediately. Thus one can take the view that it is the government's responsibility to make as much progress as it can in achieving the conditions of social welfare optimisation, recognising that it will fail to satisfy some of the conditions somewhere in the economy all of the time. In this case, the fact that some conditions are not met can be regarded as a temporary rather than a permanent circumstance, in which case the theory of second best does not apply - since this theory implicitly assumes that it is <u>impossible</u> to achieve the necessary conditions in at least one part of the economy, whereas "practical neo-classical welfare economics" has to take the view that it is possible, albeit difficult and time consuming, to satisfy all of the necessary conditions eventually. In other words, the theory of Second Best can deteriorate into "letting the best be the enemy of the good".

H   THE 'SOCIAL WELFARE FUNCTION' IMPLICIT IN THE WELFARE ARITHMETIC.

In making these assumptions, we are implicitly assuming something about the "Social Welfare Function". The implicit value judgement is being made (under i above) that £ notes are an appropriate and constant measure of the well-being of the people involved, since the arithmetic is necessarily conducted in value terms. In effect, the implicit assumption is: that £1's worth of loss to the producer/consumer is exactly equivalent to £1's worth of gain to the consumer/producer, which is the consequence of the net welfare sum ('economic surplus' or 'resource cost'). That is to say: we can 'trade-off' producers and consumers (and taxpayers) welfare at the rate of £1 for £1, ie the implicit Social Welfare Indifference Curve is a straight line!, and furthermore, that social welfare is *cardinal*, as an addition of cardinal measures of peoples' gains and losses.

Yet Lipsey's Positive Economics is supposed to be value free - we are not supposed to make value judgements about relative welfare of different people. How do we get away with this? Answer: because it is assumed that the appropriate re-distribution of income, wealth, factor ownership etc. can be achieved through some "resource neutral" and costless fashion which need not concern or complicate the welfare (resource allocation) analysis. **All the 'welfare' analysis shows is by how much the total productive capacity of the economy is altered by a policy change**. It actually has nothing to do with 'welfare' in the ordinary sense of the word. Such an assumption is heroic in the extreme, and certainly does not accord with practical experience.

Is there an alternative? Josling, for one, argues (Formal Approach) that the transfers themselves (the gains and losses) are more important than the net economic surplus, and that the distribution of the transfers among people (in Josling and Hamway) is of crucial interest. Thus we should concentrate on identifying and estimating these transfers, and then on publicising them, so as to inform the political process of the consequences of various policy changes. This will allow the political process to take proper account of these effects in making the value judgements which go to make up the "social welfare function". Otherwise, to quote Josling, "the absence of a social welfare function poses a fundamental problem for policy analysis".

It is possible to go one step further. If the social weights on the gains and losses are made explicit, by (say) making £1 to at least some consumers (the poorer ones) worth more than the £1 to the richer people, then a different 'welfare' answer can be determined. If a policy intervention actually does seem to transfer income from the richer to the poorer, then it is possible that, in spite of the "deadweight" resource costs of the intervention as measured by the conventional welfare arithmetic, the policy is socially desirable - given the greater importance of (weight attached to) the gains versus the losses. Alternatively, (and perhaps more academically/scientifically respectably) the policy question can be turned around, so as to identify the minimum weights which would be necessary to make a particular intervention socially desirable, and to ask the 'political process' whether these weights do properly reflect the social valuation of peoples' welfare.

Conclusions: You should now be in a position to read and understand the major thrust of the arguments in Harvey: "Extensions and political analysis of the CAP" Ch. 8, *The Common Agricultural Policy and the World Economy*, 2nd. edn., eds. Ritson C.R. and Harvey, D.R., CABI, Wallingford, 1997